

## TERRIBLE 1

### WHAT IS CLAIMED IS:

1           1.       A method for building a table having  $n$  entries to select  $r$  most frequently  
2 used Internet site names from  $m$  Internet site names that can be received at a resource  
3 delivery site, so that the resource delivery site can cache the corresponding resources  
4 from the  $r$  most frequently used Internet sites in advance where  $r \leq n$ , the method  
5 comprising the steps of:

6       (a) receiving an Internet site name from a packet;  
7       (b) storing the Internet site name in an entry of the table if the Internet site name is not in  
8       the table; and  
9       (c) counting the number of times the Internet site name has been received, characterized  
10      in that  
11  $m > n$  and if the Internet site name is new and the table is full, an entry of the table is  
12 replaced.

1           2.       The method of claim 1 wherein the Internet site name is a URL (Uniform  
2 Resource Locator).

1           3.       The method of claim 1 wherein each entry of the table has a name field for  
2 storing the Internet site name and a count field for storing the number of times the  
3 Internet site name has been received.

1           4.       The method of claim 3 further comprising the step of retrieving  $r$  most  
2 frequently used Internet site names according the value of the count field of each entry.

1           5.       The method of claim 3 wherein if the table is full and the Internet site  
2 name is not in the table, replace one of the  $q$  least frequently used entries according to the  
3 value of the count field of each entry.

1           6.       An apparatus for building a table to select  $r$  most frequently used Internet

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2 site names in a resource delivery site, so that the resource delivery site can cache the  
3 corresponding resources from the  $r$  most frequently used Internet sites in advance, the  
4 apparatus comprising:

5 (a) a memory for storing the table having  $n$  entries where  $n \geq r$ , and each entry  
6 comprises a name field; and

7 (b) a processor for receiving an Internet site name from a packet and storing the Internet  
8 site name into the name field of an entry in the table, characterized in that

9 if the table is full and the Internet site name is not in the table, the processor replaces one  
10 of the  $q$  least frequently used entries, where  $q < n$ .

1 7. The apparatus of claim 6 wherein the Internet site name is a URL  
2 (Uniform Resource Locator).

1 8. The apparatus of claim 6 wherein if the table is full and the Internet site  
2 name is not in the table, the processor randomly selects one of the  $q$  least frequently used  
3 entries for replacement.

1 9. The apparatus of claim 6 wherein if the table is full and the Internet site  
2 name is not in the table, the processor replaces the least frequently used entry among the  
3  $q$  least frequently used entries.

1 10. The apparatus of claim 6 wherein each entry in the table further comprises  
2 a count field for storing the number of times the associated Internet site name in the entry  
3 has been received.

1 11. The apparatus of claim 10 wherein if the Internet site name is in one of the  
2 entries, the processor increments the value of the count field.

1 12. The apparatus of claim 11 wherein the processor sorts the entries in the  
2 table into an order according to the value of the count field of each entry.

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1           13.     The apparatus of claim 12 wherein the order is descending, whereby the  $r$   
2     most frequently used Internet site names are in the first  $r$  entries.

1           14.     The apparatus of claim 12 wherein the sorting method is a bubble sort  
2     method.

1           15.     The apparatus of claim 10 wherein the processor retrieves the  $r$  most  
2     frequently used Internet site names from the top  $r$  entries according to the value of the  
3     count field of each entry.

1           16.     An apparatus for building a table to select  $r$  most frequently used Internet  
2     site names in a resource delivery site, so that the resource delivery site can cache the  
3     corresponding resources from the  $r$  most frequently used Internet sites in advance, the  
4     apparatus comprising:

5     (a) a receiver for receiving an Internet site name;

6     (b) a processor for converting the Internet site name into a number and storing the  
7     number into an entry in the table; and

8     (c) a memory for storing the table having  $n$  entries where  $n \geq r$ , each entry in the table  
9     comprising a number field for the number, a name field for the Internet site name and  
10    a count field for counting the number of times the Internet site name is received,  
11    characterized in that

12    if the table is full and the number is not in the table, the processor replaces one of the  $q$   
13    least frequently used entries according to the value of the count field of each entry, where  
14     $q < n$ .

1           17.     The apparatus of claim 16 wherein the Internet site name is a URL  
2     (Uniform Resource Locator).

1           18.     The apparatus of claim 16 wherein if the number is in one of the entries,  
2     the processor increments the value of the count field.

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1           19.    The apparatus of claim 16 wherein the processor retrieves the  $r$  most  
2 frequently used Internet site names from the top  $r$  entries according to the value of the  
3 count field of each entry.

1           20.    The apparatus of claim 16 wherein the processor sorts the entries in the  
2 table into an order according to the value of the count field of each entry.

1           21.    The apparatus of claim 16 wherein the processor uses a hash function for  
2 the conversion.

1           22.    The apparatus of claim 16 wherein if the number is not in the table and the  
2 table is not full, the processor stores the number and the Internet site name in the  
3 respective fields of an empty entry.

1           23.    The apparatus of claim 16 wherein if the number is in an entry and the  
2 value of the count field of that entry is greater than a threshold, the processor stores the  
3 Internet site name in that entry.

1           24.    The apparatus of claim 16 wherein if the table is full and the number is not  
2 in the table, the processor randomly selects one of the  $q$  least frequently used entries for  
3 replacement.

1           25.    The apparatus of claim 16 wherein if the table is full and the number is not  
2 in the table, the processor replaces the entry with the smallest value of the count field  
3 among the  $q$  least frequently used entries.

1           26.    The apparatus of claim 16 wherein the table comprises  $q$  sub-tables where  
2  $n > q > 1$ , each sub-table has  $n/q$  entries and pointed to by an address ranging from 0 to  $q-1$ ,  
3 the number is searched or stored in the sub-table pointed to by the address produced by

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4 taking a modulo operation on the number by  $q$ , if the sub-table is full and the number is  
5 not in the sub-table, the processor replaces one of the bottom  $m/q$  entries according to the  
6 value of the count field of each entry, and retrieves the  $r$  most frequently used Internet  
7 site names from the top  $r$  entries among the  $q$  sub-tables according to the value of the  
8 count field of each entry.

1 27. A computer program product having a computer readable medium having  
2 computer program logic recorded thereon for building a table to select  $r$  most frequently  
3 used Internet site names, the computer program product comprising:  
4 (a) a computer program code segment for receiving an Internet site name from a packet;  
5 (b) a computer program code segment for converting the received Internet site name into  
6 a number;  
7 (c) a computer program code segment for storing the number in the table having  $n$  entries  
8 where  $n \geq r$ , each entry in the table comprising a number field for the number, a  
9 name field for the received Internet site name and a count field for counting the  
10 number of times the Internet site name has been received, characterized in that  
11 if the table is full and the number is not in the table, the storing computer program code  
12 segment replaces one of the  $q$  least frequently used entries according to the value of the  
13 count field of each entry, where  $q < n$ .

1 28. The computer program product of claim 27 wherein the received Internet  
2 site name is a URL (Uniform Resource Locator).

1 29. The computer program product of claim 27 wherein if the number is in  
2 one of the entries, the storing computer program code segment increments the value of  
3 the count field.

1 30. The computer program product of claim 27 further comprising a computer  
2 program code segment for retrieving the  $r$  most frequently used Internet site names from  
3 the top  $r$  entries according to the value of the count field of each entry.

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1           31.     The computer program product of claim 27 further comprising a computer  
2 program code segment for sorting the entries in the table into an order according to the  
3 value of the count field of each entry.

1           32.     The computer program product of claim 27 wherein the converting  
2 program code segment uses a hash function for the conversion.

1           33.     The computer program product of claim 27 wherein if the number is in  
2 the table and the table is not full, the storing computer program code segment stores the  
3 number and the received Internet site name in the respective fields of an empty entry.

1           34.     The computer program product of claim 27 wherein if the number is in an  
2 entry and the value of the count field in that entry is greater than a threshold, the storing  
3 computer program code segment stores the received Internet site name in the name field  
4 of that entry.

1           35.     The computer program product of claim 27 wherein if the table is full and  
2 the number is not in the table, the storing computer program code segment randomly  
3 selects one of the  $q$  least frequently used entries for replacement.

1           36.     The computer program product of claim 27 wherein if the table is full and  
2 the number is not in the table, the storing computer program code segment replaces the  
3 entry with the smallest received count among the  $q$  least frequently used entries.